

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD SAN DIEGO REGION

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Fact Sheet Questions and Answers on the

"Interim Guidance on Low-Risk Petroleum Hydrocarbon Cleanups"

This Fact Sheet is intended to further amplify the guidance contained in the State Board letter for fuel contaminated cleanup sites within the San Diego Region through the form of "Answers" to frequently asked questions regarding implementation of the new interim guidance on mitigation of fuel contaminated sites.

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A What is considered a "source" when completing source removal?

Leaking tanks and appurtenant structures must be removed or repaired. Free product or soil which contains sufficient mobile constituents (leachable pollutants, vapors) to degrade surface water and groundwater quality above water quality objectives or provide a significant threat to human health or the environment should be considered a source.

Gasoline or diesel free product fits this definition at virtually all sites. Oil and grease, degraded crude oil, and degraded diesel may not be soluble enough to be considered a significant source and often do not degrade water quality or present a significant risk to human health or the environment.

Many factors need to be considered when determining if a given petroleum release constitutes a source.

- Depth of the affected soil below ground surface
- Depth to groundwater below ground surface
- Soil type and physical properties
- Presence of preferential pathways (i.e. old wells, utility trenches, etc.)
- Type of petroleum released
- Infiltration rate
- Spatial distribution of petroleum concentrations
- Total mass of petroleum released
- Trends in monitoring data
- Chemical and physical properties of any residual hydrocarbons

Good judgment must be used when weighing these and other factors. For old releases, the absence of current groundwater degradation often is a good indication that residual concentrations present in the soil are not a source of pollution. In general, if pollutants within fuel

contaminated soil are not in contact or expected to come in contact with the groundwater, it is unlikely that it is a significant source of pollution.

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A What is the status of ASTM RBCA?

Use of ASTM RBSLs. The American Society of Testing and Materials (ASTM) standard for Risk Based Corrective Action (RBCA), ASTM E-1739-95, details a framework and provides a methodology to perform a tiered risk analysis at petroleum release sites. This methodology incorporates EPA risk assessment practices to determine non-site specific (tier 1 look up table which provides generic risk based screening levels) and site specific (tier 2 and tier 3) clean up levels that are protective of human health and environmental resources. At this time, it is not clear that the values listed in the abbreviated tier 1 look up table published with the ASTM-RBCA guidance are consistent with carcinogenic risks calculated based upon California Cancer Potency Factors (see Office of Environmental Health Hazard Assessment- OEHHA, Memorandum dated June 18, 1992). The abbreviated tier 1 look up table included in ASTM E-1739-95 should "not be interpreted as a list of proposed standards" (see text discussion on page 6 of the ASTM-RBCA Standard ES 38-94).

The assumptions implicit in the use of equations published in the ASTM-RBCA protocol (e.g., see Appendix X2: Estimation of RBSLs and SSTLs and Appendix X3: Integration of predictive modeling into the RBCA process) may not be appropriate for use within the range of environmental conditions found in California. The proposed determination of screening levels (e.g., RBSLs and SSTLs), based upon the use of the equations published in the ASTM-RBCA protocol, must give results which are consistent with current state requirements for the protection of sensitive environmental resources. More

specific guidance from the SWRCB is required before the ASTM-RBCA RBSLs and SSTLs can be evaluated for common use.

Use of ASTM SSTLs. The agencies (RWQCB and LOP staff) have approved the use of contaminant fate and transport models proposed by responsible parties (RPs) in Region 9. The proposed use of a contaminant fate and transport model is reviewed and evaluated by agency staff on a site-by-site basis. The contaminant transport equations listed in Appendix X3 of the ASTM-RBCA ES 38-94 standard may be evaluated on a site-specific basis. Historically, the primary application of contaminant fate and transport models has been to evaluate long-term threats to ground water resources from residual fuel contaminants left in vadose zone soils at the site. RWQCB staff have been instrumental in supporting the use of results from cost-effective contaminant leachability tests (e.g., modified-TCLP and SPLP, EPA Methods 1311 and 1312, respectively) to help establish site-specific soil cleanup levels which are protective of water resources.

Fate and Transport Evaluation. Very often the use of proposed contaminant fate and transport models also include an evaluation of contaminant mitigation by natural attenuation. At sites where ground water impacts have already occurred, the RWQCB staff generally require that historical ground water monitoring data be used to evaluate the effectiveness of the site-specific natural attenuation processes as a site.

What is a sensitive receptor?

Water wells, deeper drinking water aquifers, surface water bodies, sensitive habitats such as wetlands, marshes, or mudflats, human beings, aquatic plants and animals, and other wildlife are all sensitive receptors. Property lines and other political or administrative boundaries are not considered to be sensitive receptors for the purposes of this guidance.

How do we determine if there is significant ecological risk at the site?

There is no current standard method for determining potential threats to the environment or aquatic receptors. When appropriate, risk-based cleanup methodologies would identify this as a potential exposure pathway that is not included in the current "look up tables" and will therefore require a higher tier analysis. This analysis may require additional evaluation of migration pathways such as storm drains and other manmade conduits. Currently, evaluation protocols are being developed, and look up tables for ecological receptors may be developed in the future. The lack of a standard protocol or look up table does not eliminate the requirement to evaluate this pathway, especially in nearshore or Bay front locations.

The State Board letter states that active remediation should be replaced with monitoring at low risk sites. What technologies are considered "active remediation"?

Active remediation refers to remediation of dissolved groundwater plumes. Mechanical systems that inject or remove material from the dissolved phase plume are considered active remediation. Examples of active remediation include groundwater extraction systems, air sparging systems, and hydrogen peroxide injection systems. Vapor extraction, bioslurping and other source removal systems are not considered active remediation if they are removing a source of pollution as defined in Question 1 above.

What technologies for free product removal are currently considered practicable?

Appropriate excavation of the impacted material surrounding the leak is one of the best source removal technologies available. Manual bailing, passive skimming, and pumping of groundwater are only marginally effective at removing free product. Vacuum enhanced free product recovery (i.e. vapor extraction, bioslurping, etc.) has been shown to be a highly effective method for removing mobile free product. Each site needs a determination of the cost-effectiveness of the various techniques taking into account the soil type, amount of free product present, potential for the free product to act as a source, preferential pathways, and other factors that affect hydrocarbon movement at the site.

What 'reasonable justification' would be compelling enough to use active remediation on the dissolved hydrocarbon plume?

A partial list of reasons that may be compelling are listed below:

- Groundwater within the plume is likely to be used before natural attenuation is projected to complete the cleanup.
- Sensitive aquifers and/or sensitive receptors have been identified and are projected to be adversely impacted.
- The plume is migrating significantly.

Generally, if any of these conditions or others deemed to be reasonable justification are met, a more aggressive remedial approach may be appropriate.

What criteria are used to determine plume stability?

The experience of RWQCB staff indicates that petroleum plumes in the subsurface tend to stabilize once the source is removed. Natural attenuation of hydrocarbons is the main reason this stability occurs.

Many factors influence plume stability including hydrogeology and those listed in Question 1. However, chemical concentrations of hydrocarbons in groundwater that decrease or do not change with time are the best indicators of a stable plume. Comparison of background and hydrocarbon plume concentrations

of dissolved oxygen, iron, nitrate, sulfate, methane, and others, can provide evidence for potential in-situ biodegradation at a given site. These data may or may not be required to determine plume stability, but can supplement other lines of evidence.

Stable or decreasing plumes often display short-term variability in groundwater concentrations. These effects are due to changes in groundwater flow, degradation rates, sampling procedures, and other factors which are inherently variable. This behavior should not necessarily be construed as evidence of an unstable plume but may be the natural variability of a stable plume in the environment.

What should the monitoring frequency be?

The frequency of monitoring should be commensurate with the need for data to make required decisions at the site. Quarterly monitoring may be appropriate in the early stages of investigation when extent of contamination, seasonal groundwater fluctuations, and other site specific factors are being evaluated. After these have been determined, monitoring frequency may be reduced to perhaps annually and number of monitoring points reduced to selected wells only. Long term monitoring should be limited to collecting only the minimum data needed to verify that site conditions are stable or improving and that natural attenuation is effective. Much of this information has already been collected at many existing sites.

Can existing active remediation systems at low risk sites be turned off even though established remedial goals have not been reached?

Yes. If the site is evaluated using the new interim guidance and active remediation is not indicated, then active treatment at the site may be terminated. The lead regulatory agency will make this determination. If the extraction system is necessary to provide hydraulic control of the plume which prevents contaminants from reaching a sensitive receptor, then continued pumping may be warranted.

When can adjacent site data be used in lieu of site specific data?

Local hydrogeologic data can often be inferred from data collected at adjacent sites. Depth to groundwater, depth to regional aquifer, groundwater gradient, soil types that may be present, and chemical concentrations may all be of value in directing an investigation. A conceptual model of the site may be formed using local or adjacent site data. Data collected during a site investigation should clarify the conceptual model and help to guide any further work at the site.

If a site is only monitoring and no active remediation is anticipated, can the site be closed?

Regulatory agencies have broad discretion to determine whether or not regulatory action is necessary and appropriate at a given site. Under current policies, the monitoring period could be many years depending upon the

magnitude of the release, remedial actions taken, and biodegradation rates at the site. Closure of low risk UST sites would be appropriate as soon as enough data supported the conclusion that the source had been removed, the plume had stabilized, and natural attenuation was expected to achieve water quality objectives (e.g. MCLs) in a reasonable time.

The State Board has indicated that policies regarding petroleum cleanup standards will be reviewed in 1996 pursuant to SB1764 requirements. Changes in closure policy regarding low risk groundwater cases may be a result of that review.

What action should be taken if a responsible party refuses to take any action at a site and cites this guidance as the reason for inaction?

Responsible parties are required to comply with all regulatory requirements. If they disagree with a directive or think it is in violation of current regulatory practice, they have the opportunity to appeal that directive through the proper channels. Responsible parties may face enforcement actions if they disregard regulatory requirements and do not appeal using the appropriate procedures.

If a responsible party wants to pursue a more aggressive remedial strategy than stated in the State Board letter, will the Cleanup Fund pay for the additional remediation?

The Cleanup Fund manager has stated that the Fund will only reimburse costs for those activities that are required by regulatory agencies. For low risk cases, regulatory agencies should not approve work plans for active remediation unless adequate justification is provided. Article 11, section 2727f of the Underground Storage Tank Regulations requires that responsible parties propose the most cost-effective corrective action. This will be monitoring, without active remediation, in many cases.

What public notification is required when implementing this guidance?

The implementation of the LLNL recommendations suggested by the State Board letter does not change the public notification requirements already stated in the UST regulations in Chapter 11, Section 2728. That section requires that the public must be informed of the proposed activities contained in a site's corrective action plan. If a site's corrective action plan is modified to the extent that it is essentially a new corrective action plan, then it may be appropriate for the public to be notified of the new plan.

Will future use of an impacted property be restricted by implementation of State Boards' recommendations?

No change in current practice is expected. Generally, sites are remediated to either residential or commercial/industrial requirements based on current and projected future land uses. If a site is cleaned up to

commercial/industrial standards and the land use changes to residential, then further risk assessment and possibly mitigation or remediation may be required.

The current UST "no further action" letter requires that the implementing agency be notified if a change in land use occurs.

How does this guidance fit with existing and future policy?

From the December 8, 1995 letter, "What I propose to you is not in any way inconsistent with existing policies or regulations. However, it does represent a major departure from how we have viewed the threat from leak USTs." Under the requirements of SB 1764 the legislature expects the State Water Resources Control Board to propose and make further permanent changes to the interim guidance, perhaps as early as this spring. Meanwhile, the Regional Board and the local regulating agencies will be implementing the interim guidance.

Do "low risk soil and groundwater sites" apply to basins without designated beneficial uses (Non-Beneficial Use)?

Yes. However, based on the site location, potential human health exposure, or its proximity to surface waters, additional remediation may be necessary. A discharger must implement active remedial measures at a site when results from the site investigation show that explosive hazards exist or impacts to surface waters and/or storm-water conveyance systems in excess of the water quality objectives for the receiving water has occurred or is very likely to occur.

FOR FURTHER INFORMATION: Please contact the Regional Board. Initial contact should be with John Anderson, Supervisor of the Site Mitigation and Cleanup Unit at 619-467-2975. He can direct your question(s) to the appropriate Regional Board staff person. It should be noted that most fuel contaminated UST sites in the San Diego Region are regulated by the local county health agencies: San Diego County Department of Environmental Health (Mr. Chuck Pryatel at 619-338-2449), Orange County Health Care Agency (Ms. Karen Hodel at 714-667-3700) and Riverside County Department of Environmental Health (Ms. Sandy Bunchek at 909-358-5055).

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